Small Business Innovation Research/Small Business Tech Transfer

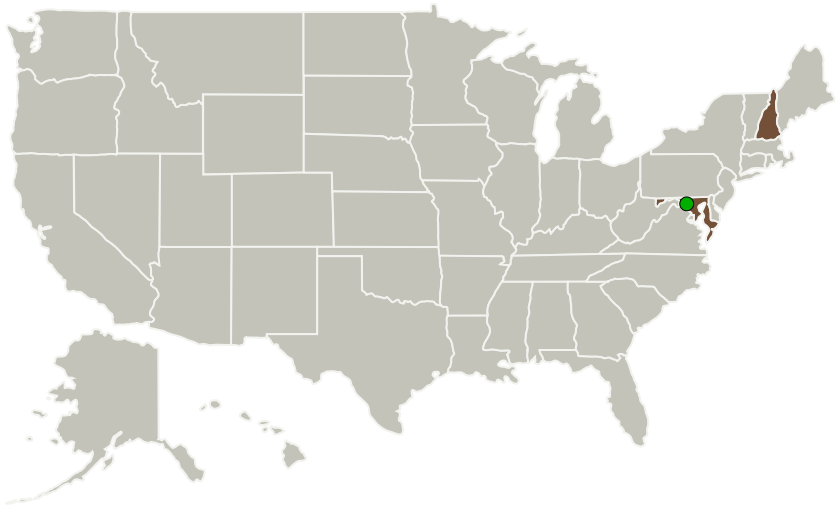
VLWIR Sensors for Detecting and Tracking Near-Earth Asteroids, Phase I

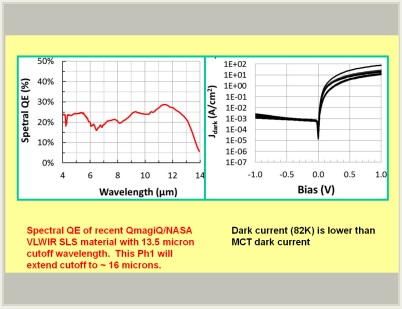
Completed Technology Project (2017 - 2017)

Project Introduction

An important NASA mission is to detect, count and track near-earth asteroids for a variety of reasons including the hazards of collisions with our planet. Such asteroids are mostly dark, small and cold (~ 200K); so they are best detected in the very longwave infrared (VLWIR) wavelength of ~ 16 microns where they glow brightest. To accomplish this, we propose a new cooled VLWIR focal plane array (FPA) of antimony-based strained layer superlattices (SLS) that will leverage the significant advances in quantum efficiency (QE) and dark current recently achieved by QmagiQ in SLS FPAs with cutoff wavelengths upto 12 microns. Compared to the incumbent mercury cadmium telluride (MCT) technology, SLS promises comparable QE, lower dark current, and much higher array uniformity and operability. Most importantly, it offers superb image stability - which will eliminate the need for frequent non-uniformity correction when using MCT. In Phase I, we will develop and deliver a prototype FPA with 16 micron cutoff. In Phase II, we will increase FPA format and deliver a camera to NASA for evaluation.

Primary U.S. Work Locations and Key Partners





VLWIR Sensors for Detecting and Tracking Near-Earth Asteroids, Phase I Briefing Chart Image

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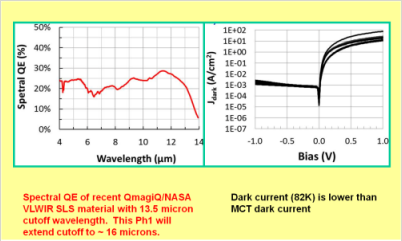
Organizations Performing Work	Role	Type	Location
QmagiQ, LLC	Lead Organization	Industry	Nashua, New Hampshire
Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland

Primary U.S. Work Locations	
Maryland	New Hampshire

Images



Briefing Chart Image
VLWIR Sensors for Detecting and Tracking Near-Earth Asteroids, Phase I Briefing Chart Image *(https://techport.nasa.gov/image/132754)*

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
QmagiQ, LLC

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

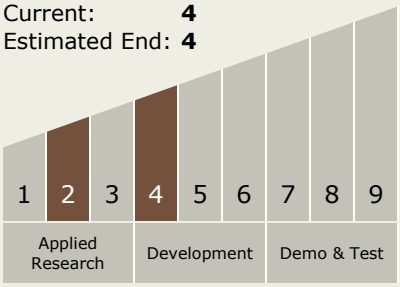
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Mani Sundaram

Technology Maturity (TRL)

Start: **2**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.1 Detectors and Focal Planes